

REPUBLICA ARGENTINA

MINISTERIO DE ECONOMIA
Y OBRAS Y SERVICIOS PUBLICOS

SECRETARIA DE PROGRAMACION ECONOMICA

INSTITUTO NACIONAL DE ESTADISTICA Y CENSOS



17 ENE 1996

INDEC

TECHNOLOGICAL

MODERNIZATION

PROGRAM

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***National Institute of Statistic and Census (INDEC)
Argentina***

Technological Modernization Program

The aim of this program is to plan and justify the introduction of new technology and ways of working that may modernize the functioning of the Argentine Institute of Statistics. This will enable the Institute to supply state and private enterprises as well as the whole Argentine society with a clear view of the evolution of the society itself and with the necessary updated data for the elaboration of new projects.

This program is part of the institutional reorganization of INDEC, whose basic objective is to elevate the standards of the Institute through the improvement of its staff's professional level, the introduction of the latest advances in technology and the betterment of the services offered.

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1. INDEC and the National Statistics System

The National Institute of Statistics and Census (INDEC) was created in 1968 and regulated by law No. 17,622 and decree N° 3110/70. Its main aim is to steer all the official statistical activities performed all over the country.

This Institute, together with Provincial Statistics Organizations ("Direcciones Provinciales de Estadística") and other Statistics Centers, constitute the National Statistics System (SEN), which is in fact directed and coordinated by INDEC.

The role of INDEC is to collect information through censuses, surveys, records, etc, for statistical purposes, and apply them to different fields, such as:

Sociodemography: information on the social, economic and demographic characteristics of the population.

Commercial activities: information on imports and exports, calculation of indices (indices for wholesale prices, construction prices, among others).

Productive activities: information on the development and activities of the primary, industrial and tertiary economic sectors of economy. This information is obtained through the national agricultural census, the economic census, industrial surveys and other programs.

2. Previous State of Affairs

INDEC, as many other state organizations, has suffered the lack of financial resources, resulting in technological obsolescence in some of its operative areas and in the absence of specialized professionals in others.

In the course of time, the outdated equipment available at INDEC could not meet the requirements of the different departments. The processing of compiled information was very slow; no prompt replies were possible.

Owing to these unfavorable conditions, the different technical departments tried to find alternative solutions: some of them resorted to microcomputers, others had their data processed in other institutions following working guidelines which had not been defined by INDEC.

INDEC was indeed in a state of anarchy: there were no overall guidelines, no

shared use of common resources, no maximization of the resources available.

Moreover, new advances in technology launched on the market could not be introduced either because of the meagre funds available or the lack of state resources.

The main role of INDEC as generator, supplier and disseminating agent of state statistics deteriorated sharply very soon. Concurrently, private companies with more influence on the market began to emerge. These companies spread the information INDEC had in fact generated but which it was unable to disseminate through lack of adequate tools. The public image of INDEC had fallen to very low standards.

It was then necessary to bring about a radical change that might allow INDEC's prompt modernization. It is important to note that this Modernization Program would have to be implemented during an institutional restructuring process carried out by the government and which included, among other measures, the recategorization of staff, new lists of ranks and salaries, moving offices, continuing with the scheduled tasks.

The new set-up conceived implied more professional work, and minimizing the faults characteristic of state organizations. Given its technical role, INDEC was expected to turn out results as effectively as any other similar public or private organization.

3. Modernization Program. The Beginning of the Change.

There was not doubt that INDEC had to improve its way of working to be in a better position to offer results to the market (the State, the public, private enterprises, etc) which demanded information for the planning of new projects or for the analysis of the evolution of society. Convinced of the need for this change, at the end of 1991 the Director of INDEC embarked on a Modernization Program with a view to reverting this state of affairs.

This modernization is based on the development of decentralized work programs, including data processing, which is a new concept in this type of state organization.

This program is currently being implemented and it affects the following areas: Computerization, Communications, Staff training, Standardization of Software, and other areas of technology applied to statistical analysis.

Below is a description of the main characteristics of the Technological Modernization Program being carried out at INDEC.

Computer equipment

This area has passed from a proprietary architecture to an Open System which allows the use of multiple equipment and software resources from interconnected suppliers working jointly, and maximizes results.

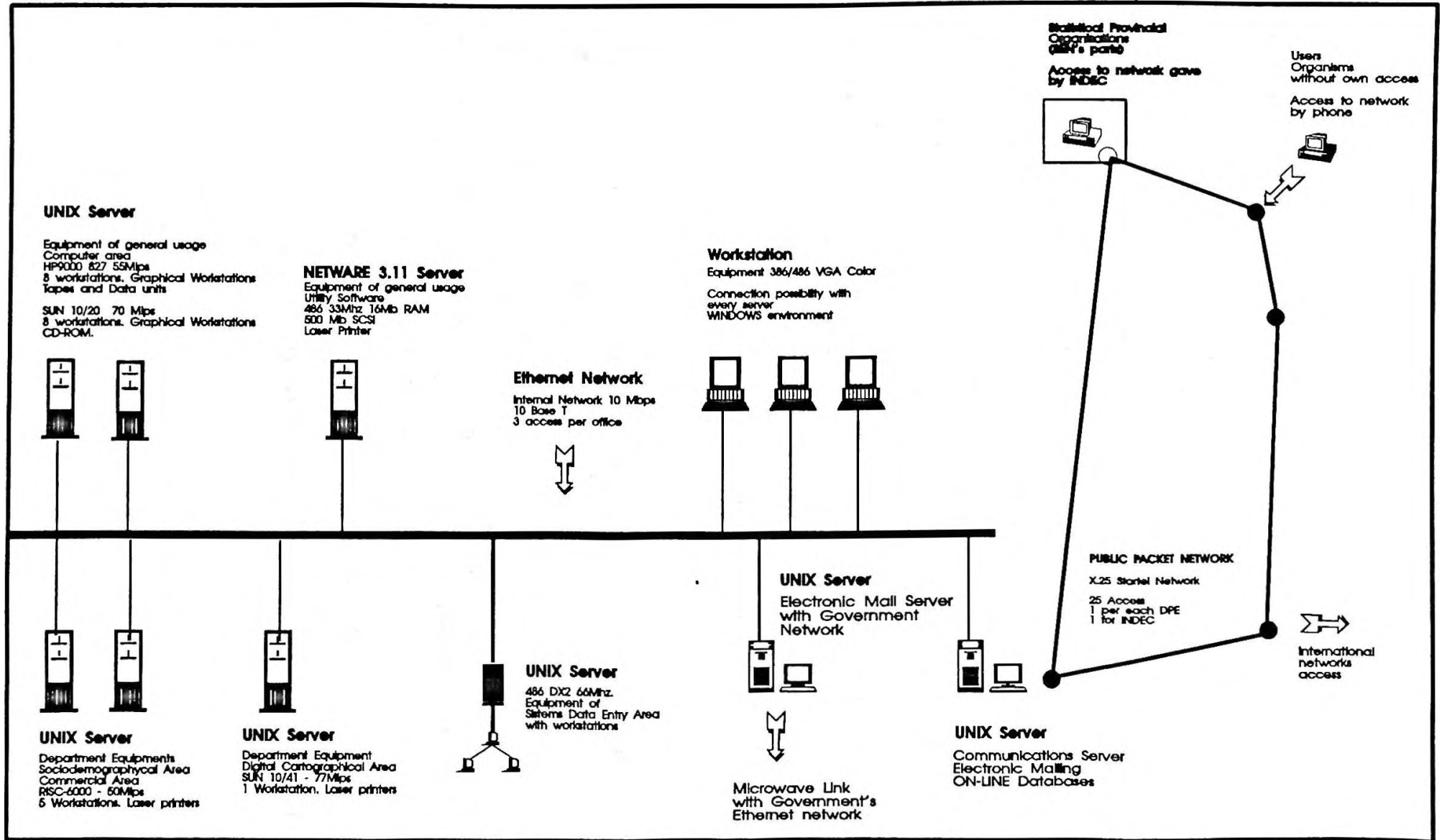
INDEC will then have an internal data network based on ETHERNET 10Base T under TCP/IP, with two or more network outlets connected to PCs in each office.

In this network, there will be UNIX servers for departmental or general services, thus doing away with the conventional concept of a Computer Center. Figure 1 shows an outline of the computer equipment for the communications area.

The adopted way of working is based on the utilization of a WINDOWS platform and UNIX servers as a means of access to information.

The set-up of this network and the installation of servers are being carried out and will be ready by the middle of 1993.

Communications and Connectivity



Norms for the use of software

No organization can work correctly if there are no clear rules for the use of resources. Therefore, standards for the development of products and utilization of programs have been established in order to define the tools for institutional use and provide the necessary support and staff training.

The criteria used in the selection of the above-mentioned tools are:

Portability

Products capable of being used on all the platforms to be installed at INDEC and in all Provincial Statistics Organizations.

Orientation

The search was directed towards tools that could simplify the creation, development and maintenance of products.

Support and Training

INDEC will provide support and training to those who use and develop the selected tools.

Standardization

The shared use of common resources will do away with the problems arising from designer-dependent institutional modifications.

Categorization and selected tools:

Tools for the development of programs to design forms, enter data, validate and process tables, etc, for all the areas (Sociodemography, Commerce, Census, etc) where the products are statistically orientated:

ISSA- *Integrated System for Survey Analysis*

A tool for the development of calculations and statistical processes.

SPSS/SAS

A tool for the development of non-statistical products.

INFORMIX*A database SQL***General purpose utilities***Electronic Sheet**Database**Word Processor**Graphs***QPRO Windows/Dos****Fox Base +/Dbase III Plus****Word Perfect DOS/ Window Letter Perfect****Hardvard Graphics 3.0 DOS****Free Lance for Windows****Base Software***Operating System DOS v5.0**Windows v3.1***Software for Graphic Design***Working platform* **WINDOWS 3.1***Graphs and logos* **COREL DRAW***Composition* **PAGE MAKER****Communications and Connectivity**

The development of a communications structure is the basis of this Modernization Program and, also, a new concept for INDEC.

The purpose of this structure is to implement the transfer and coordination of technology, to share information, and establish common working guidelines within INDEC, between INDEC and the Provincial Statistics Organizations, and between INDEC and the outside world (the government, the population, etc).

This structure of communications can be divided into two kinds: Internal and External.

Internal communications are based on ETHERNET network, which will provide INDEC with internal electronic mail, and -by means of a special electronic mail server- with an external connection to national and international centers such us CEPAL, the United Nations, etc.

External communications are based on the public X.25 packet network of Startel. INDEC has 25 accesses to this network, one of them corresponding to INDEC, and the remaining 24 to each of the Provincial Statistics Organizations. This constitutes the Data Network of the National Statistics System.

By means of this system, it will be possible to transfer information to and from the Provincial Organizations through data networks, decentralizing all processes and offering remote technical assistance.

This system will also allow the development of ON-LINE databases with INDEC's information of easy access by national and international public and private users via a packet network.

Support and Training Programs

This Modernization Program demands the development of Human Resources that can maximize the use of the technological resources available for the elaboration and production of statistics. The program coordinator has organized an ambitious series of courses to raise the professional level of the staff at INDEC and the National Statistics System.

The staff will be trained in the use of the selected tools, and steer them towards the utilization of the new work platforms.

Training courses for the staff at INDEC and the National Statistics System have already started.

New technology applied to the dissemination of information

INDEC has decided to create products that will help to spread statistical as well as institutional information.

Computerized animation, dissemination of information through magnetic means or the communications system, development of computerized editorial stations, etc, are some of the objectives of the Modernization Program.

Advances achieved in this area can be summarized as follows:

Computerization of publications design

Staff training has already been implemented and the necessary equipment to apply the latest advances in graphic design technology has been supplied to the corresponding departments.

During 1992, the staff from the departments of Information dissemination and Computerization were trained in the use of editing software (Windows, Page Maker, Corel Draw). These departments were in possession of their own equipment in November 1992, when the printed 1992 Statistics Yearly Report was finished.

Dissemination of information through magnetic means

At the beginning of 1992, the Statistics Yearly Report was created, a new version of which was obtained in November 1992. This Yearly Report was the first product to spread statistical information through magnetic means (Diskette) used by INDEC.

Information brochures

Brochures with information about INDEC's role and type of data supplied have been published.

Participation in different events

Participation in fairs, seminars, and other scientific events with a view to spreading the information and functions of INDEC.

There has been a selection of products for the presentation of information through computers, CD-ROM, and presentations that could be done on video, etc.

Development of Databases

It is fundamental for INDEC to have databases than provide immediate answers to users' requests for information. Consequently, steps have already been taken towards the development of databases such as:

ON-LINE database

A database system that enables users to access a menu through a data network or a modem and obtain information from INDEC is currently being

developed.

Consultation database

A database system that allows the reception of internal and external requests for information is also being developed.

With this system it will be possible to elaborate statistics about the requests received, the time to produce answers, types of requests, etc.

Foreign Trade database

A database system that handles Foreign Trade information has been designed. To achieve this, existing databases in state organizations in Argentina and abroad were analysed.

The database designed involves all the consulted systems and would be incorporated in an ON-LINE service.

Digital cartography and a geographic information system

INDEC has statistical cartography which is used not only for operative purposes to carry out censuses and surveys, but also as geographic reference for the provision of census information.

The Modernization Program establishes the development of a project that will decentralize processes by supplying the provinces with the necessary technology and support, and increasing the turn-out capacity of the central group at INDEC.

INDEC has started to work on satellite data processing, gradually trying to incorporate it in its routine tasks.

Technological transfer to the National Statistics System

As INDEC is the head of the National Statistics System, all the new technology incorporated will in turn benefit the National Statistics System.

Therefore, the Technological Modernization Program, in promoting the introduction of new technology and its transfer to the provinces, will improve the resources and tools and raise the standard of the statistics organizations.

Internal Organization

It has also been decided to incorporate technology and modify procedures in order to help internal operative and administrative tasks. The first step has been to computerize the administrative areas, and to train staff in the use of routine products, standards of use, etc.

4. INDEC and its future perspectives

Undoubtedly, INDEC is undergoing a period of radical structural changes (updating technology, defining new working guidelines) which will result in the clear improvement of all its services.

INDEC — Technological Modernization Program

Computer Equipment

Before the Program

Distributed PCs for area's processing.
Most of them XT/286.

HOST IBM 3031
60's Technology
2 Mb. of RAM
1.8 Gb. Mass Storage
Magnetic Tapes

Program's aims

Distributed Processing.
Access to resources from every workstation.
Internal organization: electronic mailing, administrative area.
Introduction of new technology to working programs.

UNIX TCP/IP Network
5 UNIX Servers
60 mips average
32 Mb RAM. 5Gb Disk
Graphic Stations
26 Distributed workstations
Laser Printers
Tape units
CARTRIDGE units.

TCP/IP Network 700 Workstations
Ethernet 10 base T
3 Access per office.
PCs 386/486 as workstations.

Concept

Processing

Support

Program's Evolution

- The computerization of all the administrative areas has just begun.

- Computational structure reorganization.

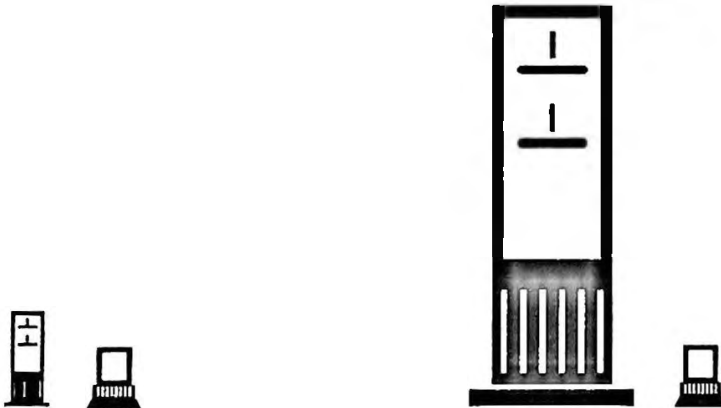
- The equipment is being installed, waiting for a complete installation for the first quarter of the current year.

- Network installation and wiring, ending at the end of march.

- Workstations: buying and installing.

- Training of new technologies since last november.

- Support Center for new technologies.



Processing capacity.

INDEC — Technological Modernization Program

Communications

Before the Program

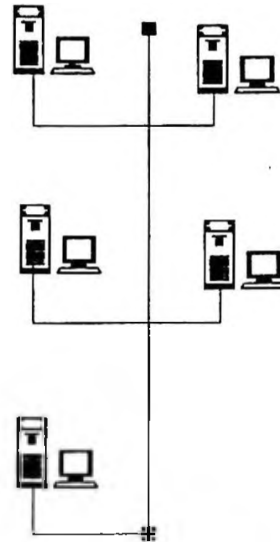
- No projects

Program's aims

- Information transfer circuits for the applications.
- Resources access from de provincial statistics organizations.
- Remote assistance from INDEC to the DPE and the current applications.
- National Statistic System's network in every provincial statistics organizations.
- Access to the public X.25 packet network.
- Access to National and International Electronic mailing.
- Database development support.

Program's Evolution

All the applications are being installed.



INDEC — Technological Modernization Program Database

Before the Program

No projects.

Program's aims

- INDEC Information's structures norms.

Database development	
Foreign commercial activities.	
EPH	
Census	
Temporal series	
Agricultural	
Development bases	
Communication's Systems	
Windows	DOS
ISSA	INFORMIX
UNIX	

Program's Evolution

- Organization for collect Informacton.

- Tools selected:
INFORMIX, ISSA,
WINDOWS development tools.

- Design of the aplcations under new concepts (EPH, Commercial).

- Trainig of aplcation's developers on new tools.

INDEC — Technological Modernization Program

New Technologies

Before the Program

Digital Cartography.

Program's aims

- Increasing the turn-out capacity for the digital cartography's area.
- Decentralize process.
- Satellite data processing.
- SIG Systems development.
- New technology in desktop publishing Laser printers technology.
- Computer design in desktop publishing.
- Presentation of statistical information through computers with CD-ROM, animations, etc.
- Statistical information through magnetic media and CD-ROM.

Program's Evolution

- New technology in Digital Cartography area.
- The decentralize process is being studied.
- All the necessary equipment for desktop publishing has been implemented. At the beginning of 1992 the Statistical Yearly Report was created.
- The Statistical Yearly Report was the first product to spread statistical information through magnetic media. CD-ROM version in study.
- Most presentations with animations and graphics was developed for national and international events.

